ABSTRACT

A write interface in a file server provides permission management for concurrent access to data blocks of a file, ensures correct use and update of indirect blocks in a tree of the file, preallocates file blocks when the file is extended, solves access conflicts for concurrent reads and writes to the same block, and permits the use of pipelined processors. For example, a write operation includes obtaining a per file allocation mutex (mutually exclusive lock), preallocating a metadata block, releasing the allocation mutex, issuing an asynchronous write request for writing to the file, waiting for the asynchronous write request to complete, obtaining the allocation mutex, committing the preallocated metadata block, and releasing the allocation mutex. Since no locks are held during the writing of data to the on-disk storage and this data write takes the majority of the time, the method enhances concurrency while maintaining data integrity.